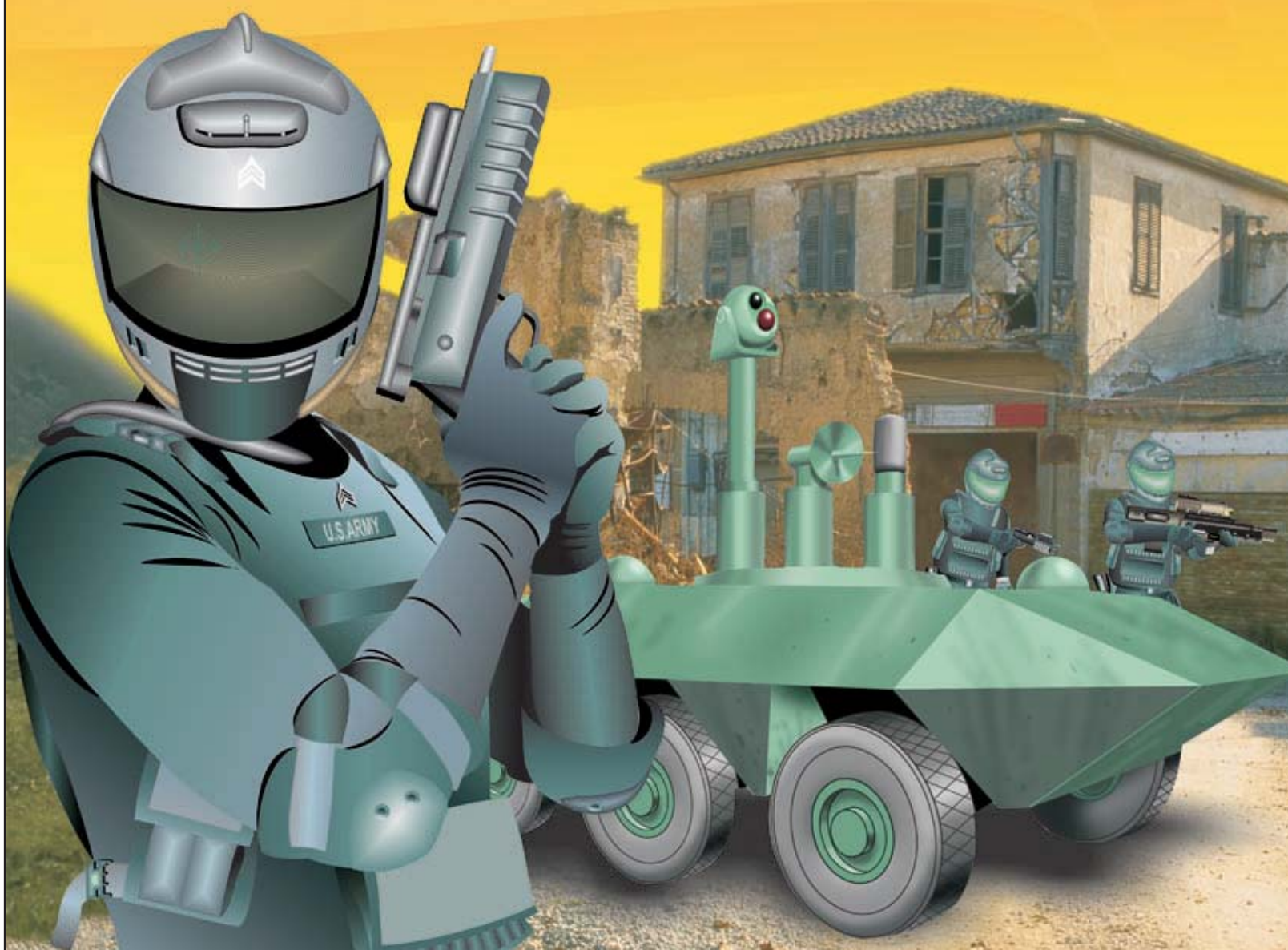




ATEC

Our Army...Our Soldiers...Our Equipment



ATEC



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Testing and Evaluation: Positioned to Support the 21st Century Army

*by MG Robert E. Armbruster
Commanding General
U.S. Army Test and
Evaluation Command*

The United States Army Test and Evaluation Command (ATEC), headquartered in Alexandria, Virginia, is a relatively new organization. However, its precursors are steeped in history and the formation of ATEC in 1999 is just the latest step in the evolution of Army testing and evaluation.

With all testing and evaluation under one umbrella, ATEC is in a unique position to plan and execute incremental developmental test plans that are event-driven and focused on preparations for successful operational tests. With the Army moving swiftly toward Transformation, ATEC's role is even more critical today. We started the transformation journey with the testing of the Stryker wheeled vehicle and by developing strong relationships with the acquisition community. Through resulting rapid feedback, we are able to accelerate the developmental cycle to support the Army's Future Combat Systems efforts and to meet the threats of the 21st Century.

Please take some time and read about our test facilities and abilities. They are awesome. ATEC has the capability to assist the materiel development community in taking a program from developmental testing all the way through the operational testing that will lead to a final fielding decision. We test everything from boots to ballistic missiles in any kind of environment. We can test in the coldest, hottest,



An M1A2 Abrams tank during Survivability and Live Fire Testing at Aberdeen Test Center in Maryland. (ATC photo)

most humid and/or the driest weather on earth. We can age a vehicle 20 years in just one year.

ATEC is a value-added partner with the acquisition and material development communities to insure all new and enhanced equipment and weapons systems meet the needs of America's men and women in uniform. This is serious business and vital to the national defense.

Our Army...Our Soldiers...Our Equipment



On November 18, 1998, the Vice Chief of Staff of the Army approved consolidation of developmental and operational testing. That decision led to the redesignation, on Oct. 1, 1999, of the Operational Test and Evaluation Command (OPTEC) to the U.S. Army Test and Evaluation Command (ATEC).

Central to the consolidation was ATEC assuming overall responsibility for all Army developmental and operational testing. The Test and Evaluation Command (TECOM) became a major subordinate command of ATEC and was redesignated the U.S. Army Developmental Test Command (DTC), with DTC headquarters remaining at Aberdeen Proving Ground, Maryland. Also, the Test and Experimentation Command (TEXCOM) was redesignated the U.S. Army Operational Test Command (OTC), with OTC headquarters remaining at Fort Hood, Texas. The third ATEC subordinate command that was redesignated encompassed both the Operational Evaluation Command and the Evaluation Analysis Center, which were combined to form the new U.S. Army Evaluation Center (AEC), completing the earlier decision to move developmental and operational evaluation into a single, integrated command. The OPTEC Threat Support Activity (OTSA) was redesignated as the ATEC Threat Support Activity (ATSA).

Under the consolidation, ATEC was also given responsibility for installation management of the White Sands Missile Range, New Mexico; Dugway Proving Ground, Utah; and Yuma Proving Ground, Arizona. On Oct. 1, 2002, the respective Installation Management Activity regional office assumed that responsibility.

ATEC also took command of the Aberdeen Test Center (ATC) at Aberdeen Proving Ground, Maryland; the Redstone Technical Test Center (RTTC) at Redstone Arsenal, Alabama; the Aviation Technical Test Center (ATTC) at Fort Rucker, Alabama; the Electronic Proving Ground (EPG) at Fort Huachuca, Arizona; the Cold Regions Test Center (CRTC) at Fort Greely, Alaska; and the Tropic Regions Test Center (TRTC), headquartered at Yuma Proving Ground with testing in Hawaii and other locations.

Since its formation, ATEC has played a major role in Army Transformation. In December 1999, ATEC was in the field evaluating medium-weight armor at Fort Knox, Kentucky, during the Platform Performance Demonstration; it conducted the Interim Armored Vehicle (IAV) Bid Sample Event at Aberdeen Test Center in Maryland; it compared the M113 and the Stryker at Fort Lewis, Washington, for Congress; and it started working on plans to conduct operational tests for the IAV in 2002.

ATEC's Wide Range of Customers

- The American Soldier
- Congress
- Chief of Staff and Vice Chief of Staff, U.S. Army
- Joint Chiefs of Staff
- Army Deputy Chief of Staff for Operations and Planning
- Assistant Secretary of the Army for Acquisition, Logistics, and Technology
- Program Executive Officer or Program Manager
- Director of Operational Test and Evaluation
- Under Secretary of Defense, Acquisition, Technology, and Logistics
- Director of Information Systems for Command, Control, Communications, and Computers
- Training and Doctrine Command
- Army Materiel Command
- U.S. Navy
- U.S. Air Force
- U.S. Marine Corps
- Ballistic Missile Defense Office
- Deputy Undersecretary of the Army for Operations Research
- Defense Threat Reduction Agency
- Foreign Countries
- Private Industry

Mission

ATEC plans, conducts, and integrates developmental testing, independent operational testing, independent evaluations, assessments, and experiments **in order to provide essential information to decision makers.**

Vision

An ATEC that is the premier test and evaluation organization within DoD—**valued by customers and decision makers for providing essential information** that ensures war-fighters have the right capabilities for success across the entire spectrum of operations.

Crest

The grid lines represent scientific method and verification in the testing programs conducted by the Command. Black and silver denote the precision and clarity required in carrying out these programs. The wreath stands for high ideals. The balance scale denotes objectivity and represents the testing and evaluation mission of the Command. Blue stands for truth, and gold for excellence.



Patch

The Command's mission, to seek truth through testing and experimentation, is symbolized by the triangle, or fulcrum, balancing a bar and sun. The bar and triangle represent a scale; the sun signifies the search for knowledge, enlightenment, and high ideals. Yellow indicates the precious metal gold and represents "the worth of quality assurance of tested products." Dark blue alludes to the sky and space, suggesting the possibilities and discoveries of the future.

The red sword characterizes the individual soldier, whose combat preparedness is aided by the data and information products the organization provides. The white expresses the Command's search for the truth and sterling quality of the products produced.

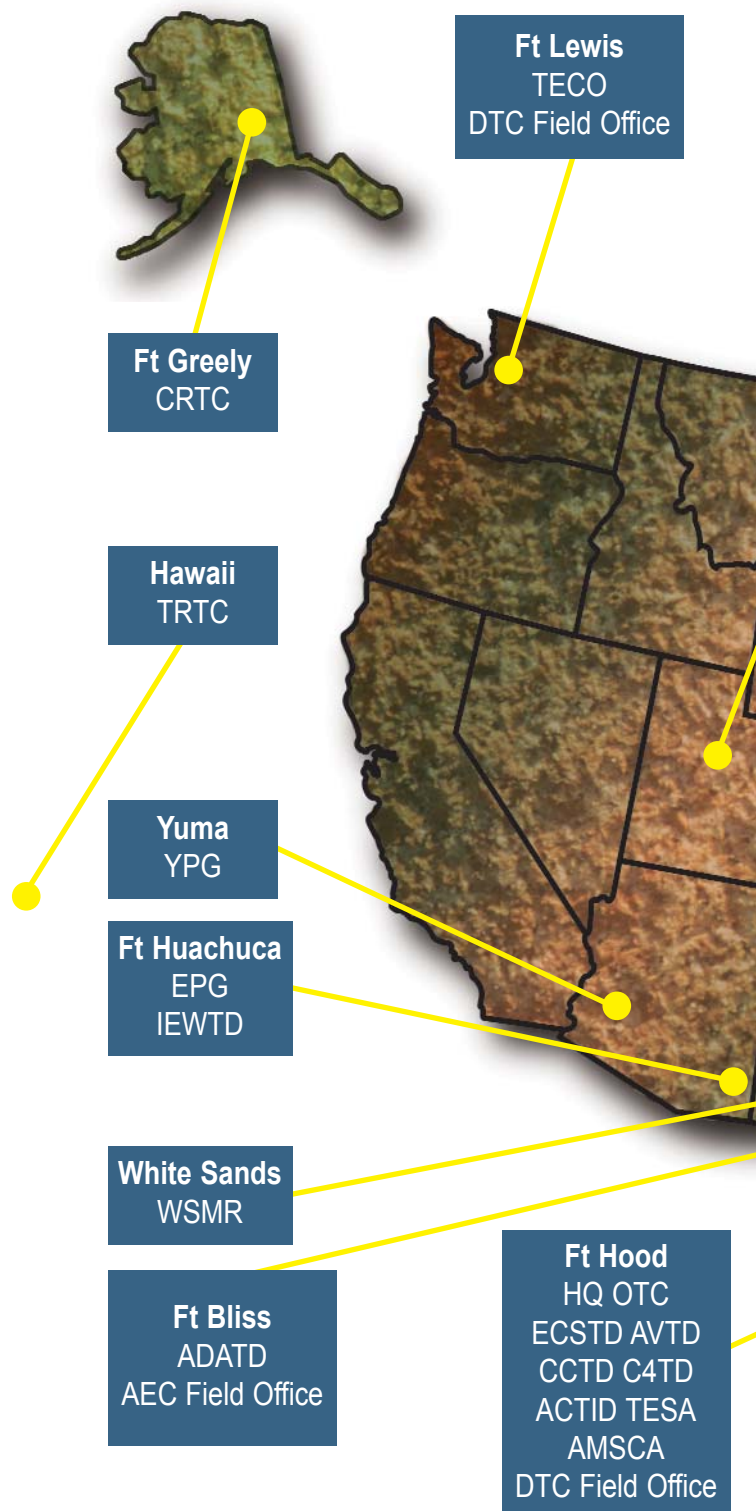


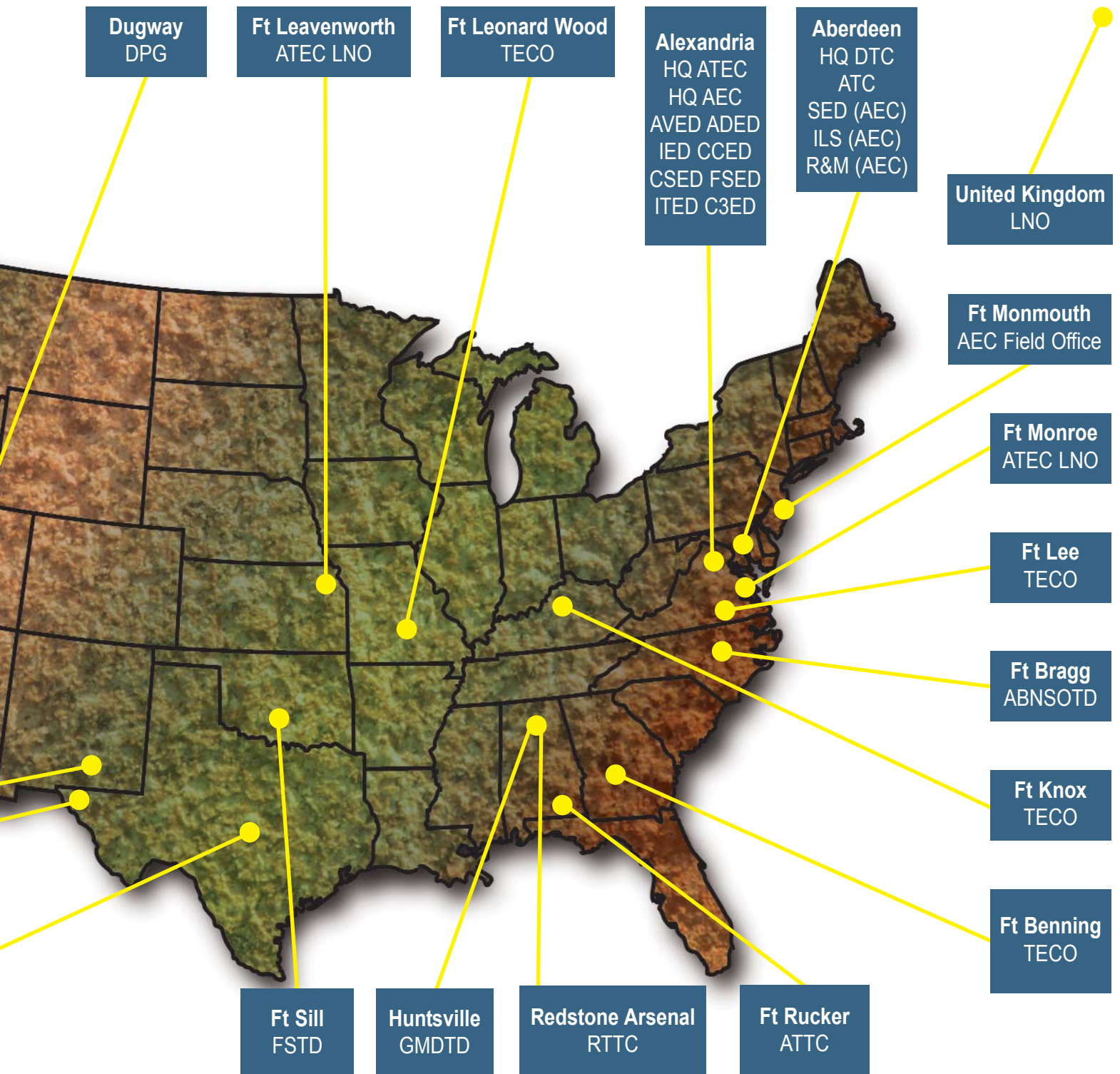


The U.S. Army Test and Evaluation Command (ATEC) is located throughout the continental United States, Alaska, and Hawaii. During any given day, approximately 1,100 tests are ongoing in the U.S. and around the world. This map gives an indication of the size and diversity of the organization. Below is an explanation of the organizations shown on the adjoining map.

ATEC Acronyms

ABNSOTD	Airborne and Special Operations Test Directorate
ACTID	Advanced Concepts Transformation Integration Directorate
ADATD	Air Defense Artillery Test Directorate
ADED	Air Defense Evaluation Directorate
AEC	Army Evaluation Center
AMSCA	ATEC Mission Support Contracting Activity
ATC	Aberdeen Test Center
ATEC	Army Test and Evaluation Command
ATTC	Aviation Technical Test Center
AVED	Aviation Evaluation Directorate
AVTD	Aviation Test Directorate
BCT	Brigade Combat Team
C3ED	Command, Control, and Communications Evaluation Directorate
C4TD	Command, Control, Communications, and Computers Test Directorate
CCED	Close Combat Evaluation Directorate
CCTD	Close Combat Test Directorate
CRTC	Cold Regions Test Center
CSED	Combat Support Evaluation Directorate
DPG	Dugway Proving Ground
DTC	Developmental Test Command
ECSTD	Engineer and Combat Support Test Directorate
EPG	Electronic Proving Ground
FSED	Fire Support Evaluation Directorate
FSTD	Fire Support Test Directorate Headquarters
GMDTD	Ground-Based Midcourse Defense Test Directorate
IED	Intelligence Evaluation Directorate
IEWTD	Intelligence and Electronic Warfare Test Directorate
ILS	Integrated Logistics Support
IMAED	Information Mission Area Evaluation Directorate
LNO	Liaison Officer
OTC	Operational Test Command
R&M	Reliability and Maintainability
RTTC	Redstone Technical Test Center
SED	Survivability Evaluation Directorate
TECO	Test and Evaluation Coordination Office
TESA	Test and Evaluation Support Activity
TRTC	Tropic Regions Test Center
WSMR	White Sands Missile Range
YPG	Yuma Proving Ground







"ATEC Conducts 1,100 Developmental and Operational Tests and Evaluations on a Daily Basis"

The USNS Shughart in the Port of Savannah during the Strategic Sealift Program test. (ATEC photo)



An M1A2 Abrams tank crosses the Dry Support Bridge during testing at Fort Hood, Texas. (ATEC photo)





An M198 155mm Howitzer on the Kofa Firing Range at Yuma Proving Ground, Arizona. (ATEC photo)



This U.S. Marine at Twenty Palms, California, participated in ATEC's Joint Service Lightweight Integrated Suit Technology test. (ATEC photo)



EVALUATIONS

AEC is the Army's Independent Evaluator—Supporting Army Transformation and the 21st Century Soldier

When testing is finished, the U.S. Army Evaluation Center (AEC) is the organization that writes the final report used by the decision-makers to determine whether a new or enhanced system will become part of the Army's 21st Century arsenal. In this role, AEC is deeply involved in the Army Transformation effort.

AEC gets involved early in the acquisition process to ensure that Test and Evaluation (T&E) programs, strategies, and objectives are consistent throughout the acquisition program.

Since T&E results figure prominently in the decisions reached at design and milestone reviews, early T&E involvement in the acquisition process serves to add value to the final product of any acquisition program. AEC evaluates and reports on each system's effectiveness, suitability and survivability to the Army senior leadership and, when requested, to Congress.

Headquartered in Alexandria, Virginia, AEC has sites in five states. There are more than 220 military and civilians in Alexandria, and approximately 155 at Aberdeen Proving Ground, Maryland. AEC also maintains a presence at Fort Lewis, Washington; Fort Monmouth, New Jersey; and Fort Bliss, Texas.

AEC consists of eight Battlefield Operating System Evaluation Directorates: Air and Missile Defense; Aviation; Close Combat; Combat Support; Fire Support; Information Technology; Intelligence; and Command, Control and Communications. It also has the newly formed Objective Force Transformation Directorate and three other directorates called "ilities": Integrated Logistic Support, Reliability & Maintainability, and Survivability.

AEC's vision is team-focused as it strives "to maintain its role as the premier evaluation organization in the Department of Defense, performing credible, comprehensive, tailored



*AEC members will evaluate the airworthiness of the RAH-66 Comanche helicopter.
(U.S. Army photo)*

evaluations and analysis that satisfy customer's requirement in support of the soldier." AEC was established under the U.S. Army Test and Evaluation Command (ATEC) umbrella in 1999 by combining the resources of the Operational Evaluation Command and the Evaluation Analysis Center. From the initial concept of a system to its placement in the hands of the soldier during the operational test phase, AEC personnel are involved every step of the way by providing valuable insight and feedback to materiel developers throughout the acquisition lifecycle. Working in coordination with the U.S. Army Developmental Test

Command (DTC), AEC monitors a system to determine whether it is meeting developmental expectations. This effort assists in discovering any potential problems early-when fixes are easier and less costly to the materiel developer.

AEC plays a major role on the ATEC Systems Team (AST), which is formed upon notification of a new system. The lead major subordinate command of ATEC will identify the chair for the new system. The AST coordinates ATEC input into the T&E Working Integrated Product Teams (T&E WIPT). The AST chair



AEC evaluators are critical in assessing the Patriot Air Defense System Advanced Capability-3 (PAC-3) system. (U.S. Army photo)



EVALUATIONS

AEC is the Army's Independent Evaluator—Supporting Army Transformation and the 21st Century Soldier (Continued)

serves as the lead voice and ensures that at least one ATEC representative is present at the T&E WIPT meetings.

AEC personnel chair approximately 95 percent of all ASTs, which include other AEC members and Subject Matter Experts from DTC and the U.S. Army Operational Test Command (OTC). AEC closely monitors operational tests. For major system programs, AEC's field grade military evaluator is the AST chair.

When a test is finished, AEC produces the System Evaluation Report (SER), an unbiased, objective account of system performance. The AEC evaluator then briefs the report through the chain of command with a recommendation to the Commanding General of ATEC. The recommendation can be for full fielding, rejection of the system, more development, or additional testing.

The Commanding General then takes his recommendation to the senior leadership. Those leaders who make milestone decisions, some at the DOD level, use AEC's SER.

Some of the many systems with which AEC has been involved recently include:

- Future Combat System
- Stryker Family of Interim Armored Vehicles (IAV)
- Maneuver Control System
- Force XXI Battle Command Brigade and Below (FBCB2)
- Integrated System Control
- All Source Analysis System Remote Workstation
- Comanche (RAH-66)
- Land Warrior
- Ground-based Midcourse Missile Defense
- Warfighter Information Network - Tactical
- Joint Tactical Radio System
- High Mobility Artillery Rocket System
- M1A2 Abrams SEP
- M2A3 Bradley Fighting Vehicle, fully digitized
- TOW Fire and Forget Missile System
- Tactical Unmanned Aerial Vehicle
- Patriot Air Defense System Advanced Capability-3
- Theater High Altitude Area Defense

A major part of AEC's mission is evaluating survivability and live fire testing of systems, such as this M1A2 Abrams Main Battle Tank at Aberdeen Test Center in Maryland. (ATC photo)



AEC travels the world to evaluate a proposed system's value to the Army or, following a joint test, to other branches of the service. AEC customers also include the Navy, Air Force, and Marine Corps. AEC also seeks to achieve greater efficiency and effectiveness through modeling and simulation. Increased system complexity and the high costs of system-level testing have forced the Army to continually explore new analytical techniques. The use of modeling and simulation in the evaluation of systems, concepts, and designs continues to grow at AEC.

As the United States military continues its fast-paced efforts to stay on top of the newest technology and the U.S. Army moves rapidly forward to remain the greatest military organi-

zation in the world, AEC will be there watching, analyzing, reporting and helping the Army complete its critically important materiel acquisition mission.

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Army senior leadership will receive evaluation reports from AEC on the Stryker Family of the Interim Armored Vehicles. (U.S. Army photo)



DEVELOPMENTAL TESTING

U.S. Army Developmental Test Command Offering a Full Range of Test Services

The U.S. Army Developmental Test Command (DTC), the developmental test arm of the U.S. Army Test and Evaluation Command (ATEC), is the Army's premier materiel developmental testing organization for weapons and equipment.

With the largest, most diverse array of testing capabilities in the Department of Defense, DTC tests military hardware of every description under precise conditions across the full spectrum of arctic, tropical, desert and other natural or controlled environments on highly instrumented ranges and test courses.

DTC offers a full range of test services, including providing unbiased test data on the technical feasibility of early concepts, determining system performance and safety, assessing technical risks during system development, confirming designs and validating manufacturers' facilities and processes at both system and component level. Its testing services are extended to all of DoD, other federal agencies,

state and local governments, foreign and allied governments, and private industry.

DTC works closely with program managers and the acquisition community to support acquisition programs through efficient and cost-effective test planning, including streamlining the test program when feasible. As an active member of Integrated Product Teams (IPTs) that include testers and evaluators, as well as program managers and executive officers, DTC supports the development of the acquisition strategy, statement of work, performance specification and test/simulation execution strategy.

Through DTC's Virtual Proving Ground initiative, new test technology investments are reducing costs by reducing test scope, prototypes and manpower requirements, and the integration of the model-test-model process allows design changes to be made early when most cost-effective.

Under its "technology infusion" concept, DTC is positioning itself to provide cost-effective, state-of-the-art test support to the transforming Army's Objective Force. As a result, DTC testing is transforming to reflect the reality of increasingly sophisticated military systems linked together through a common communications network. Our investments for new test technologies are dedicated to supporting the distributed testing of technically sophisticated network-centric systems at multiple test sites.

In addition to conducting rigorous performance tests on weapon systems and materiel, DTC tests equipment and systems under a variety of conditions and possible uses to ensure the safety of soldiers and operators. Test personnel

Instrumented mannequins placed inside the Stryker interim armored vehicle prior to live fire tests help evaluators assess the vehicle's ability to protect soldiers. (Photo by International Imaging)



report safety risks and in some cases recommend use restrictions that enhance safety. Validating the safety of systems and equipment is the key thrust of DTC's safety verification program, and it is a critical part of the DTC test mission.

DTC accomplishes its mission at several test centers - White Sands Test Center at White Sands Missile Range, New Mexico; West Desert Test Center at Dugway Proving Ground, Utah; Yuma Test Center at Yuma Proving Ground, Arizona; Aberdeen Test Center at Aberdeen Proving Ground, Maryland; Aviation Technical Test Center at Fort Rucker, Alabama; Cold Regions Test Center at Fort Greely,

Alaska; Electronic Proving Ground at Fort Huachuca, Arizona; Redstone Technical Test Center at Redstone Arsenal, Alabama; and Tropic Regions Test Center, headquartered at Yuma Proving Ground, Arizona; and providing test services in Hawaii and other tropic locations throughout the world.

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*An ATTC
experimental test
pilot assists in the
compatibility testing
of AN/AVS-6(V)3
Night Vision
Goggles in the
Apache AH-64.
(Photo by Paul
Reynolds)*





DEVELOPMENTAL TESTING

Aberdeen Test Center

Introduction

Aberdeen Test Center (ATC), on Aberdeen Proving Ground next to Maryland's Chesapeake Bay and 60 miles northeast of Washington, D.C., is the Defense Department's lead agency for land-combat, direct-fire, and live-fire vulnerability testing. ATC is a multipurpose test center with diverse capabilities. In 85 years, it has become a world-class testing, training, modeling, simulation, and experimentation facility that gives American warfighters superior materiel and technology.

ATC supports testing worldwide using extensive mobile instrumentation, satellite communications, leading technologies, and the wide-ranging expertise of a professional workforce. ATC also tests equipment and systems from other nations to support America's current and future national security requirements. As the Army's participant in the Department of Defense Test and Evaluation Pilot Program and as an accredited federal laboratory, ATC is a leading center for technology transfer and dual-use partnership initiatives within the Army, and among other Department of Defense components, industry and academia.

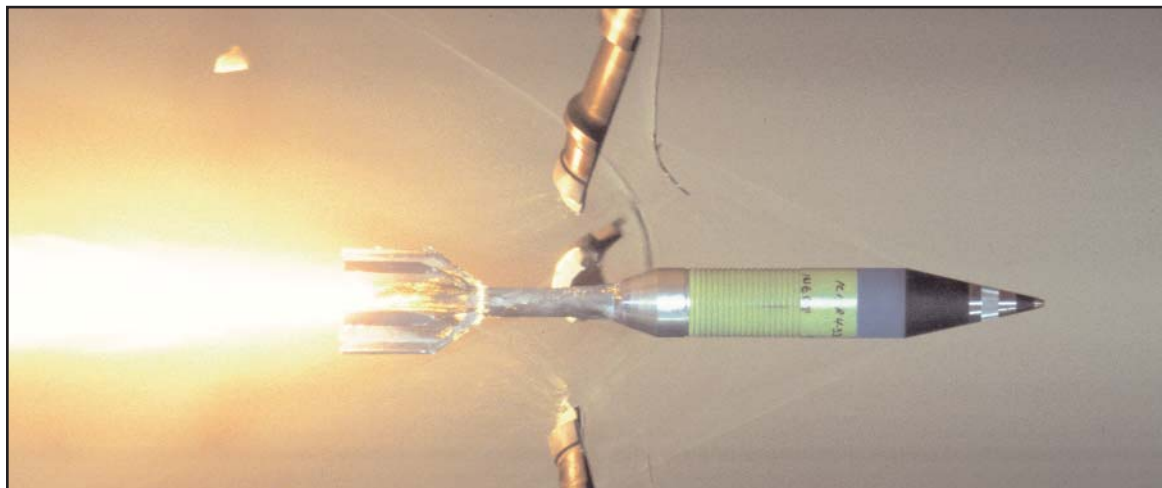
Capabilities

ATC's comprehensive capabilities, unique facilities, simulators and models enable testing and experimentation from the subsystem level to the entire system. The breadth of military weapon systems and equipment tested at DoD's only temperate-climate, general-purpose proving ground includes:

- Armored vehicles
- Guns and ammunition
- Trucks
- Bridges
- Generators
- Night-vision devices
- Individual equipment (boots, helmets, etc.)
- Surface and underwater naval systems
- Non-lethal weapons

ATC also uses a cutting-edge information system and innovative data-acquisition technologies. Satellite/high band communication and database technology enable customers to access their program information in real time through the World Wide Web. This enables test customers to make rapid, well-informed decisions throughout a system's lifecycle.

*At the Aberdeen Test Center, 35mm film cameras are still used when resolution is critical.
(Army Photo by International Imaging)*



Facilities and Support

To enhance its test capabilities, ATC is constructing the Roadway Simulator, slated for completion in January 2003. It will be the world's largest automotive test simulator.

It is an advanced system designed to conduct a wide variety of performance, safety, and durability tests such as vehicle stability; steering and handling; braking performance; powertrain performance; ride quality; body durability; and driveline dynamics on light to heavy military and commercial trucks.

Test engineers can perform tests in a highly instrumented, well-controlled and safe environment while pushing the envelope for testing and engineering analysis and obtaining repeatable measurements. The simulator will be indoors, so weather conditions will not impact test results or schedules.



The Mobile Gun System is one variant of the Stryker interim armored vehicle, which will undergo several types of testing at ATC and other DTC test centers. (Photo courtesy of General Dynamics Land Systems)

The ATC Facilities/Capabilities Guide is available on CD-ROM upon request, and information is also available at www.atc.army.mil.

Tests

Recent tests and programs include:

- "Stryker"- Interim Armored Vehicle
- Family of Medium Tactical Vehicles (FMTV) Competitive Rebuy Program
- Commercial Aircraft Vulnerability Testing
- Objective Individual Combat Weapons System (OICW)
- Advanced Amphibious Assault Vehicle
- Land Warrior
- Heavy Dry Support Bridge
- Intelligent Vehicle Program for the Department of Transportation
- Standardized Unexploded Ordnance (UXO) Demonstration Center

Future

ATC remains vital to the evolution of Army Transformation. ATC's unique combination of world-renowned facilities, high-technology instrumentation, and highly skilled and experienced workforce enable ATC to test technologies for tomorrow's Army.

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DEVELOPMENTAL TESTING

Aviation Technical Test Center

Introduction

The Army Aviation Technical Test Center (ATTC) at Fort Rucker, Alabama, is the airworthiness-qualification and airborne-systems flight tester for the U.S. Army. Airworthiness qualification tests assess the handling qualities of the aircraft and their performance (e.g., in flight, while hovering, during autorotation, etc.) and flight in icing conditions. ATTC plans, tests, analyzes and reports on the developmental and airworthiness qualification of aircraft, and aviation systems and equipment throughout their lifecycle.

Capabilities

ATTC conducts lifecycle testing and aircraft evaluations at DoD's Major Range and Test Facility Bases and various remote sites. Testing also includes aviation life-support equipment, armament, ground support, avionics, targeting,

countermeasure and flight-simulator systems. Testing focuses on systems performance; reliability; maintainability; operator/maintenance documentation; human factors engineering; and system safety. ATTC also provides depot-level aircraft modification, fabrication, prototyping services and instrumentation tailored to each flight-test program.

ATTC's fleet of 17 rotary- and fixed-wing test-bed aircraft, representative of the Army's fielded aviation systems, can be equipped and instrumented to test components and subsystems from multiple on-board computer workstations, to reduce flight-testing time and speed up system development. Technical engineering data is recorded and telemetered to ground stations for real-time or post-flight analysis.

*The Aviation
Technical Test
Center tests aircraft
such as the
CH-47F. (U.S. Army
Photo by Paul
Reynolds)*



Facilities and Support

Based at Cairns Army Air Field (CAAF), ATTC enjoys a total of 206,000 square feet in building space, full access to the two hard-surface runways and numerous airfields. Fort Rucker's flying area covers about 32,000 square miles. Also at Cairns field are a tethered hover pad and a calibrated slope landing area. Maintenance facilities include three hangars and 12 support shops, while engineering, headquarters and support facilities are located in ATTC's remaining 36 buildings at Cairns.

When specific test range capabilities or climatic conditions are required, ATTC teams conduct tests at various remote sites or at DoD Major Range and Test Facility Bases.

Tests

- RAH-66 Comanche Combined Test Team
- Flight Test Simulation Station (FTSS)
- HH-60L Medical Evacuation (MEDEVAC)
- AH-64D Longbow Airworthiness and Flight Characteristics Evaluation
- A/MH-6 Mission Enhanced Little Bird (MELB) Air Worthiness and Flight Characteristics Evaluation
- CH-47F Developmental Testing
- Air Warrior Integrated Aircrew Ensemble Developmental Testing

Future

In June 2002, ATTC launched a significant program for Army aviation. Lead the Fleet (LTF) is a program designed to capture information about specific aircraft through an accelerated-flying-hours program. In this way, the Army can acquire information about aircraft reliability to detect, document and investigate problems before they can impact the Army's fleet of aircraft. By collecting and analyzing engineer-



ing data that affect aircraft across the spectrum of Army aviation, the LTF program can provide a more affordable, reliable and safer world-class Army aviation capability.

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ATTC is playing a major role in testing the RAH-66 Comanche, the Army's light helicopter of the future. (U.S. Army photo)



DEVELOPMENTAL TESTING

Cold Regions Test Center

Introduction

The Army's Cold Regions Test Center (CRTC), in Alaska's rugged interior, offers a full range of test capabilities and expertise for all cold-weather tests. The center operates over 670,000 acres of range amid one of the world's best cold-weather testing environments. Winter there is characterized by periods of below-zero temperatures that last from several days to several weeks, with lows occasionally plunging to -50 degrees Fahrenheit.

Experience in testing military equipment for cold extremes has shown that ambient temperatures must remain within test guidelines for at least a six-hour block. CRTC has these periods 10 times as frequently as winter test sites in the lower 48 states. Environmental chambers in the lower-48 states have been used to simulate the arctic environment, but they cannot duplicate the synergistic effects of temperature, wind and snow in an area large enough to truly represent winter warfare.

Soldiers at the Cold Regions Test Center kick up a snow flurry firing a Javelin Anti-tank Missile. (U.S. Army photo)

Capabilities

CRTC professionals test an astonishing variety of items, including:

- Combat and tactical vehicles
- Infantry and special operations weapons
- Ammunition
- Missiles
- Clothing
- Power generation and decontamination equipment
- Direct fire and indirect fire weapons

Facilities and Support

CRTC has years of experience in combining developmental and operational testing, normally done separately at most other locations. CRTC has always used soldiers from tactical units to operate equipment or wear specially designed cold-weather clothing during tests. While a variety of CRTC facilities support testing, the Bolio Lake Test Complex is the hub for all testing and test administration at CRTC. It contains the cold-start engine test facility as



well as large maintenance and storage facilities. CRTC tests at several areas on Fort Greely or in the vicinity, depending on test requirements.

Firing Ranges - CRTC has eight ranges for tests associated with small arms, direct fire, artillery and explosives.

Military Operations in Urban Terrain - The CRTC has access to MOUT facilities located on Fort Greely for testing small arms.

Allen Army Airfield - Within season, the airfield can accommodate all U.S. military aircraft.

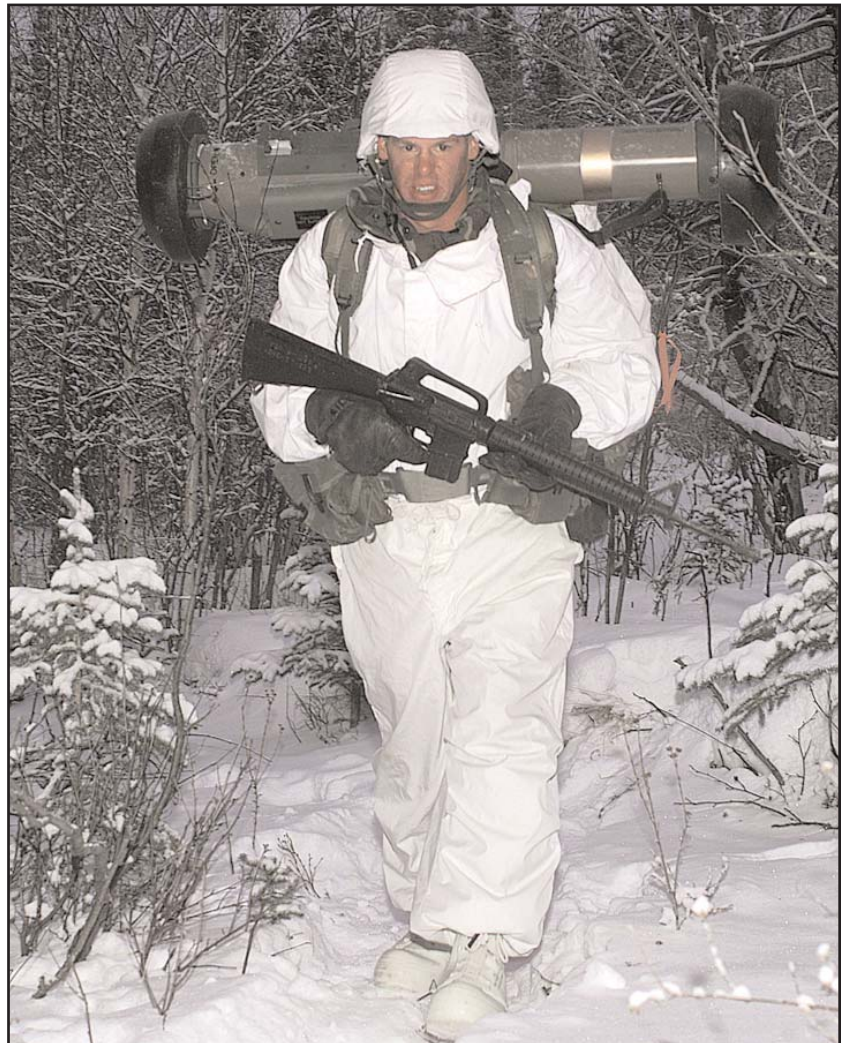
Tests

CRTC is capable of a wide variety of tests. Recent-year tests include:

- Armored Security Vehicle (ASV)
- XM777 155mm lightweight howitzer
- Javelin anti-tank missile system
- Hornet top attack munition
- Sense and Destroy Armor (SADARM) artillery round
- USMC Predator Unmanned Aerial Vehicle
- USMC Medium Tactical Vehicle
- Small Unit Support Vehicle
- Family of Medium Tactical Vehicles

Future

In fiscal year 2001, CRTC headquarters moved to Fort Wainwright, two hours away, but the major portion of the testing workload remains at the Bolio Lake Test Complex near Fort Greely. This facility continues providing soldiers with equipment that works under the most severe weather conditions. Future construction will upgrade maintenance and support facilities at various test sites. Upcoming tests include



the M1A2 Abrams Main Battle Tank, Joint Chemical Agent Detector, the Stryker and the Hybrid Electric HMMWV.

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The Cold Regions Test Center offers nearly ideal conditions for testing soldier systems in severe cold weather. (U.S. Army photo)



DEVELOPMENTAL TESTING

Dugway Proving Ground

Introduction

The U.S. Army's Dugway Proving Ground serves as the nation's chemical and biological defense proving ground. Home to the West Desert Test Center, it is a large, remote, closed post on 798,855 acres of land in the Great Salt Lake Desert - about 85 miles southwest of Salt Lake City, Utah. Established February 1942, Dugway employs about 1,200 military, government civilians and support contractors.

An Italian soldier takes part in a NATO exercise at Dugway using simulants. (Photo by Al Vogel of WDTC)



Capabilities

Dugway's primary mission is testing the Chemical and Biological (CB) defense systems of the United States and its allies, and testing the Nuclear, Biological and Chemical (NBC) contamination survivability of defense materiel. With more than 50 years of experience, the proving ground uses state-of-the-art laboratories, chambers and extensive field test grids to determine the performance characteristics of test items. Other significant core missions include:

- CB weapons conventions support
- CB defense model development and validation
- Testing of environmental characterization and remediation technology
- World-class support for meteorological and atmospheric transport modeling
- Testing of smoke and obscurant systems and illumination devices

Facilities and Support

The Lothar Salomon Life Sciences Test Facility boasts 32,000 square feet of multifunctional biology laboratories. It is the only DoD facility equipped to test with aerosolized Biosafety Level-3 (BL-3) agents. The BL-3 containment suites cover 3,300 square feet of the facility. Dugway tests protective clothing and equipment, biological detectors and decontamination systems using simulants, pathogens or toxins. Only simulants are used outdoors.

The Melvin Bushnell Materiel Test Facility is the world's largest environmentally controlled containment chamber, supporting indoor testing of large-scale military vehicles and equipment in hazardous environments. The facility's Multipurpose Chamber can accommodate any military equipment that meets NATO shipping requirements.

The modern 35,000 square-foot Reginald Kendall Combined Chemical Test Facility supports testing of protective clothing and masks, detectors and decontamination systems using chemical agents as challenge materials. The 52 fume hoods and 27 surety-capable test suites are used for laboratory tests and support chamber and field tests.

The Four-Dimensional Weather System, developed by Dugway in collaboration with the National Center for Atmospheric Research, highlights meteorological modeling. It includes the highest-resolution operational mesoscale modeling system in the world. The proving ground has extensive ranges and grids for artillery, smoke, obscurants and illumination testing as well as a state-of-the-art command center.

Dugway's Virtual Proving Ground (VPG) will revolutionize how the West Desert Test Center tests products. The plan is to develop comprehensive testing procedures that can increase DPG's current test capabilities. VPG will add modeling, simulation, and networking technologies that will provide better and faster test support at a lower cost.

Tests

- Joint Biological Point Detection System
- Joint Biological Early Warning System
- Critical Reagents Program
- Biological Technology Characterization by Unconventional Signatures
- Restoration of Operations Advanced Concept Technology demonstration
- Protective Suit System and swatch testing
- Assembled Chemical Weapons assessment
- Joint Services Lightweight Standoff Chemical Detection

Future

The proving ground is gaining local and national attention as an ideal training site for federal, state and local emergency-management and response organizations.

Dugway will continue to provide real-time meteorological analysis and near-term forecasts to the Defense Threat Reduction Agency and Department of Energy.

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DEVELOPMENTAL TESTING

Electronic Proving Ground

Introduction

The Electronic Proving Ground (EPG) at Fort Huachuca, Arizona, is part of the DoD Major Range and Test Facility Base and is the Army's premier organization for testing Command, Control, Communications, Computer and Intelligence (C4I) equipment and systems. EPG has access to the 76,000 acres of the post as well as selected government and private land. EPG also has field offices at Fort Hood, Texas, and Fort Lewis, Washington.

Capabilities

EPG's remote location and an environment free of radio-frequency interference make it the principal Army test center for electronic systems, including the developmental testing of C4I systems, unmanned aerial vehicles, and navigation and avionics systems. EPG is capable of testing distributed communication systems, emphasizing "systems of systems" tests. EPG's Virtual Electronic Proving Ground allows for testing in a combination of real, virtual and constructed environments.

A 70-ton tank is tested on the Compact Range Tower, a Virtual Proving Ground facility at the Electronic Proving Ground. (Photo by Douglas Smith (EPG))



Its customer base includes Army program managers, other military services, foreign governments and U.S. industry. EPG personnel are well trained in radio frequency technology, software development and testing, and hardware design and production.

Test capabilities at EPG include:

- Electromagnetic compatibility and vulnerability of tactical electronic equipment
- Intra/interoperability of tactical, automated C4I systems
- Electronic countermeasures

Facilities and Support

EPG has developed a suite of test instrumentation that includes test control, test stimulation, test data acquisition and virtual jamming. It is the Army's tester for unmanned/micro aerial vehicles and has extensive capabilities in the areas of Global Positioning System testing, propagation simulation, C4I battlefield emulation, and the use of existing battle simulations in test and training activities. EPG maintains a full-service range and can track and collect data from all types of air and ground systems. Test capabilities include the full spectrum of electronics testing.

EPG's test facilities include:

- Tactical Radio Testbed
- Electromagnetic Environmental Test Facility (modeling and simulation)
- Environmental Test Facility
- Fabrication Facility
- EMI/EMC/TEMPEST Test Facility
- Instrumented Test Range
- GPS Test Facility
- Antenna Test Facility



The Electronic Proving Ground at Fort Huachuca, Arizona, has the capabilities to test unmanned aerial vehicles such as the one pictured here. (Photo by Andre Hastie)

Instrumented range services include video and telemetry tracking, position location via radar and Position Location System (PLS) systems, air surveillance and tracking, and meteorological monitoring.

Tests

During EPG's 47 years, it has tested most of the Army's major C4I and electronic warfare systems. Current tests include:

- Force XXI Battle Command Brigade and Below
- Enhanced Position Location Reporting System
- Suite of Integrated Infrared Countermeasures
- Single Channel Ground and Airborne Radio System
- Tactical Unmanned Aerial Vehicle
- Global Positioning System
- Prophet (signals intelligence and electronic warfare system)
- Joint Tactical Radio System

EPG is participating in efforts to support the Army's Brigade Combat Team, part of the Army's transformation. EPG is currently responsible for C4I-related safety testing and will in the future be responsible for ensuring that the C4I systems in the Stryker interim armored vehicle are properly installed and functional.

Future

EPG will maintain a state-of-the art test and evaluation capability ready to meet the increasingly complex testing needs of customers in the 21st century. To accomplish this, EPG envisions an integrated instrumentation suite - a collection of components and applications built around a common hardware and software architecture, supporting C4I testing and training through all stages of the acquisition process.

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DEVELOPMENTAL TESTING

Redstone Technical Test Center

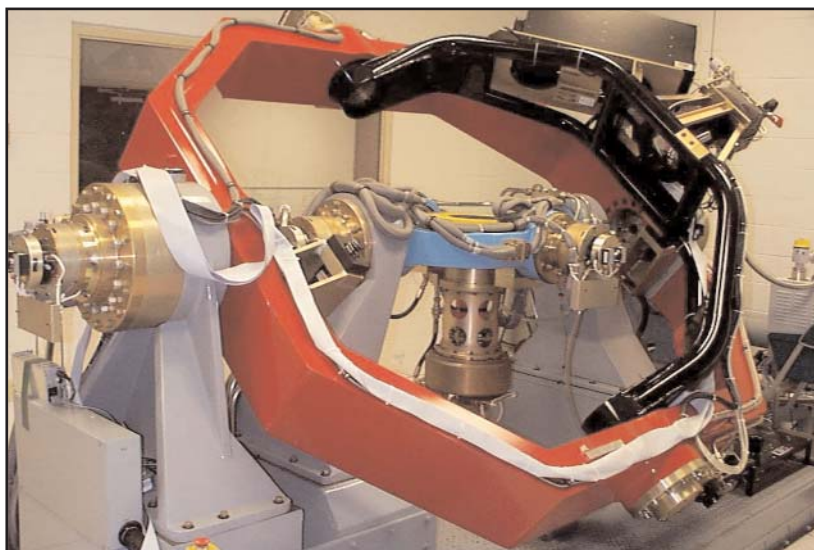
Introduction

Redstone Technical Test Center (RTTC), on Redstone Arsenal in northern Alabama, is the Army's foremost tester of small rockets, missiles, and weapon components and subsystems. RTTC is an integral part of the Army's missile and rocket lifecycle testing programs and has served as its cornerstone for more than 50 years. Located in the foothills of the Smoky Mountains, RTTC employs highly instrumented open-air ranges.

Capabilities

RTTC's state-of-the-art laboratory and range capabilities are constantly evolving to meet the needs of its customers. As an objective government tester, the test expertise offered by its experienced engineers and technicians is of the highest quality. The ability to respond to changing customer needs is a major reason RTTC has attracted and maintained its large client base. Its facilities are designed for rapid test reconfiguration with minimal customer expense and maximum scheduling flexibility and responsiveness.

The Flight Motion Simulator at Redstone Technical Test Center helps the Army test missile flight performance without firing a live missile. (Photo courtesy of RTTC)



RTTC has unique capabilities for testing inert and explosive components. Its extensive laboratory and range test capabilities provide an effective means of verifying component, subsystem and system performance before flight testing. RTTC is the only lightning-effects tester of explosive items worldwide and operates the Army's largest rocket-motor static test facility. It offers complete test capabilities for small rocket and missile systems, including flight, warhead and motor performance.

RTTC also tests the airworthiness of Army aircraft components and subsystems for safety, qualification and reliability. It performs all types of Environmental and Electromagnetic-Environmental-Effects (E3) testing and tests sensor systems such as radars and electro-optical components under simulated battlefield conditions that include obscurants and counter-measures.

At Redstone and throughout the world, RTTC performs developmental and lifecycle tests, and tests for quality assurance and stockpile reliability.

Facilities and Support

RTTC's test and test support services are available to government agencies, allied nations and private industry. Support services include:

- Full instrumentation
- Digital data acquisition and processing systems
- Photographic and video equipment
- Test plan development
- Test evaluation
- Engineering
- Enhanced testing through integrated modeling and simulation



The main charge warhead of a Javelin missile detonates upon impact with a T-72 tank hulk at Redstone Technical Test Center's Test Area 1 Flight Range. (Photo courtesy of RTTC)

RTTC uses historical data, test results for similar systems and carefully planned test events to provide the specific data needed to evaluate a system's effectiveness, suitability and survivability. This is supplemented by verified, validated and accredited models and simulations, providing accurate test data and estimates of performance over a variety of conditions that would be cost-prohibitive through testing alone.

Redstone Arsenal - with the Army Aviation and Missile Command (AMCOM); the Aviation and Missile Research, Development and Engineering Center (AMRDEC); and NASA's Marshall Space Flight Center - gives RTTC access to additional test facilities and technical resources.

Tests

RTTC tests have included:

- Javelin anti-armor system
- Hellfire/Longbow missile
- Army Tactical Missile System/Brilliant Anti-Armor Submunition
- HYDRA 70 machine gun
- Patriot missile

- M72 Light Antitank Weapon
- Theater High Altitude Area Defense
- Air Warrior system
- Comanche helicopter
- Tactical Unmanned Aerial Vehicle

RTTC also has tested for private industry and other military services, including Boeing, Lockheed Martin, NASA, the Navy and Air Force.

Future

By developing personnel skills and facilities and by integrating the latest technological advances into current test capabilities, RTTC is evolving to meet current and future Army needs for testing weapon systems.

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DEVELOPMENTAL TESTING

Tropic Regions Test Center

Introduction

The Tropic Regions Test Center (TRTC), headquartered at U.S. Army Yuma Proving Ground, Arizona, provides customer services in Hawaii and other tropic areas, where it conducts tests on a wide variety of military weapon systems, materiel, and equipment. The primary tropic test facility is in Hawaii, with the principal site at Schofield Barracks. With the 1999 closure of Army facilities in the

Republic of Panama, the TRTC is working with tropical experts from the Army Research Office and academia to identify other locations to meet specific requirements.

The Army began systematic tropic-environment testing in the Panama Canal Zone during World War II, with more than 300 people assigned to that mission during the busy Vietnam War days. The organization has since been downsized, reconfigured to operate in a wider geographic area, and placed under the command of Yuma Proving Ground.

Testing in the tropics is essential because heat, humidity, solar radiation, insects, fungus, bacteria, rainfall, and other factors combine to reduce the performance of man, machines and materials quickly. The unique combination of tropic conditions in Hawaii and other sites means managers can plan and conduct tests where they are most realistic and true-to-life.

Capabilities

TRTC planners are extensively involved with combined developmental and operational testing, often working with soldier equipment. Test capabilities in Hawaii are, or will soon, include:

- Soldier systems test sites
- Corrosion testing at fixed facilities
- A MANPACK portability course
- Exposure cages
- Firing range access
- Small caliber weapons firing

In addition to the Hawaii facility, TRTC has a suite of sites elsewhere in the tropics to provide the capabilities to meet all additional tropic test needs.

A soldier from the 25th Infantry Division runs while participating in a test of the MOLLE modular pack system at Schofield Barracks, Hawaii. (U.S. Army photo)





A soldier from the 25th Infantry Division leaps over an obstacle during a test of the newly designed MOLLE modular pack. (U.S. Army photo)

Facilities and Support

The Tropic Regions Test Center offers diverse testing sites to meet the environmental testing needs of customers now and in the future. Support and infrastructure include:

- Troop support from the 25th Infantry Division on a case-by-case basis
- Facilities and services from the 25th Infantry Division (vehicles, meteorological data, geodetics and other surveying data, etc.)
- Office complex at Schofield Barracks
- Test contractor support

Future

Future test operations will involve dual-use, off-the-shelf-technologies with military and civilian applications, such as advanced sensors with multiple application capabilities and multinational cooperative efforts to gather and

share information of mutual interest. Innovative partnerships currently being negotiated with agencies and universities in the United States and elsewhere will allow customers to leverage capabilities across a wide range of sites and borders to provide a tropic test activity that is second to none. Tropic test facilities are currently being established over a wide geographic area.

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DEVELOPMENTAL TESTING

White Sands Missile Range

Introduction

White Sands Missile Range (WSMR), home to White Sands Test Center (WSTC), is where the United States entered both the atomic and space ages. On July 16, 1945, the world's first atomic bomb was successfully tested at its Trinity Site. At WSMR, the U.S. put the earliest rockets into the upper reaches of Earth's atmosphere.

Established July 9, 1945, the missile range is in the Tularosa Basin of south-central New Mexico. At 3,200 square miles, the range is the largest military installation in the country, and it can also add another temporary 2,400 square miles for tests needing more area. The headquarters area is 20 miles east of Las Cruces, New Mexico, and 45 miles north of El Paso, Texas.

A Line of Sight
Antitank Missile test
is conducted at White
Sands Missile
Range. (U.S. Army
photo)



Capabilities

WSTC provides test, evaluation, research, analysis and other technical services to the Army and the Department of Defense, from the developmental stages to the end of a system. The premier open-air/overland test range and its laboratories make White Sands a one-stop test location. Test capabilities include:

- Air defense
- Smart weapons
- Fire support
- Nuclear effects
- Air-to-surface
- Air-to-air
- Space

Facilities and Support

The range has more than 1,500 precisely surveyed instrumentation sites with many types of optical and electronic instrumentation and laboratory test facilities. Mobile and fixed instrumentation systems include:

- High-speed cameras
- Tracking telescopes
- Interferometer systems
- Radars
- Telemetry tracking and receiving stations

Computer systems process and correlate the volumes of data to provide scientists and engineers with timely and reliable performance records.

Other range services include calibration, communication, meteorology, photography, television, aerial target support and relatively easy and fast recovery of test items to facilitate evaluation.

Laboratory testing facilities include:

- Nuclear environments
- Weapon systems simulation
- Guidance and control propulsion
- Climatic
- Metallurgical
- Microbiological



An Army tactical missile heads skyward at White Sands Missile Range. (U.S. Army photo)

Tests

Several noteworthy tests were accomplished recently, including:

- Guided Multiple Launch Rocket System
- High Mobility Artillery Rocket System
- Navy's Standard Missile
- Interim Armored Vehicle
- Joint Air-to-Surface Standoff Missile (JASSM)
- Patriot Missile
- Advanced Medium Range Air-to-Air Missile

White Sands also has the facilities necessary to conduct some types of operational tests. On February 16, 2002, WSMR fired one Patriot Advanced Capability 3 (PAC-3) missile at a missile target while firing two PAC-2 missiles at a sub-scale aircraft and full-scale aircraft emitting radar-jamming signals. During this test, six vehicles were in the air at the same time and required most of the range's optics, telemetry and radar assets.

Future

WSMR is making the transition to a new state-of-the-art range control facility to upgrade testing of air- and missile-defense systems, ground-attack systems, air-to-air systems, air-to-ground systems and direct-energy systems. White Sands is also leading the way in joint interoperability testing and combined developmental and operational testing.

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DEVELOPMENTAL TESTING

Yuma Proving Ground

Introduction

Established in 1942, Yuma Proving Ground is responsible for three test locations: Yuma Test Center, Tropic Regions Test Center, headquartered at Yuma Proving Ground, Arizona, and operating in Hawaii and other tropic areas, and Cold Regions Test Center, Alaska. Yuma tests nearly every weapon system in the ground-combat arsenal. With more than 1,300 square miles, Yuma Test Center can test military munitions and hardware in an area removed from urban encroachment and noise concerns. Its climate, terrain and excellent range facilities are perfect for testing and training.

An M3 Bradley Fighting Vehicle fires a TOW missile on the Kofa Firing Range at Yuma Proving Ground. (U.S. Army photo)



Capabilities

Of the four extreme natural environments recognized as critical for military testing, three are managed at Yuma Proving Ground - desert, cold and tropic. Yuma Test Center capabilities include:

- Ground weapons systems, from small arms to long-range artillery
- Helicopter armament and target acquisition systems
- Artillery and tank munitions
- Cargo and personnel parachutes, including guided systems technologies
- Mines and mine-removal systems
- Tracked and wheeled vehicles in a desert environment
- Vibration-free, interference-free tests of smart weapon systems
- Laguna Army Airfield complex, featuring a 6000-foot and 5,150-foot runway
- Nuclear Regulatory Commission license for firing depleted uranium ammunition at multiple ranges

Facilities and Support

Yuma's Kofa artillery range extends 55 miles, making it the longest such range in the nation. The Cibola Range's 840 square miles of controlled, unrestricted airspace over rugged terrain allows helicopters a 360-degree field of fire. More than 200 miles of improved road courses provide grueling testing of military vehicles. Yuma has the most modern mine, countermine and demolitions test facility in the western hemisphere.

Yuma's instrumentation is state-of-the-art. Fiber optics acquires and transmits a nearly unlimited amount of test data. Wide-band networking permits materiel and combat developers to view video feeds from test sites at their home locations along with near-real-time data



An AH-64D Apache Longbow helicopter hovers over rugged terrain at Cibola Firing Range on Yuma Proving Ground, where helicopter systems have been tested since 1971. (U.S. Army photo)

reduction of selected test parameters. High-speed telemetry systems, coupled with Yuma Test Center's real-time system, allow for complete control and monitoring of testing. New investments in modeling and simulation will enhance Yuma's ability to support the Army's Transformation Plan and conduct reliable and cost-effective testing.

Tests

Examples of the test center's defense contributions are numerous. About 100 tests take place at any one time. Recent examples include:

- XM777 155mm lightweight howitzer
- Army and Navy Unmanned Aerial Vehicles (UAVs)
- AH-64D Longbow Apache helicopter
- RAH-66 Comanche helicopter
- M-1A2 Abrams tank
- Bradley Fighting Vehicle
- Stryker
- Hellfire, Stinger and Brimstone missiles fired from helicopters
- Palletized Loading System
- Crusader self-propelled howitzer

Future

As it meets the challenges of the new century, Yuma Proving Ground and Yuma Test Center will play a vital role in partnering with other government agencies, private industry and academic organizations to enhance the technical excellence and high quality of America's military arsenal.

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OPERATIONAL TESTING

U.S. Army Operational Test Command The Army's Only Independent Operational Test Organization

As the U.S. Army transitions to a force for the 21st Century, so does the Army's only independent operational test organization - the U.S. Army Operational Test Command at Fort Hood, Texas, as it independently validates each new item of equipment developed for use by the American Soldier.

OTC has the mission to conduct realistic operational testing in the critical areas of equipment, doctrine, force design and training. The command conducts the operational tests,

required by Public Law, that provides significant data to Army decision makers on key Army systems and concepts.

Located with the OTC Headquarters command and staff, on West Fort Hood, is the Test and Evaluation Support Activity and five of the 10 test directorates. OTC has five other test directorates located off-site.

While many tests are conducted at Fort Hood with its large soldier population, test teams are deployed anywhere in the world to accomplish their test mission. OTC's objective is to conduct the operational tests where the soldiers are.

While land warfare and the soldiers are the focal point of the Army mission, strategic deployment to get the land forces to the battlefield is also important. OTC has several Joint service operational tests ongoing to satisfy this requirement.

OTC becomes involved in the Army's acquisition process following laboratory and technical tests that ensure the product does what the Army expected it to do. That product is handed off to OTC to test in the hands of the intended user - the soldier.

OTC uses highly sophisticated and state-of-the-art technology, both instrumentation along with modeling and simulation, to collect test data that will document performance levels and operational suitability.

A soldier in MOPP gear during the Dry Support Bridge Initial Operational Test and Evaluation at Fort Hood, Texas. (OTC photo)





*OTC will conduct the Initial Operational Test and Evaluation of the Stryker Brigade Combat Team. ATEC and OTC have been involved in the medium armor transformation effort since December 1999.
(U.S. Army photo)*

Army transformation has prioritized technology in the business of operational testing and in June 2002 a new directorate was formed to centralize all the technological capabilities used in operational testing.

OTC's new Transformation Technology Directorate (TTD) is charged with predicting future technologies while, at the same time, providing current technology expertise to test teams. TTD is responsible for accrediting/certifying technology for specific applications; monitoring technology during use in tests and experiments; and performs System Manager responsibilities for development and acquisition of technologies

A mainstay of the instrumentation systems used is OASIS (OTC Analytic Simulation and Instrumentation Suite) that integrates modeling and simulation tools with test instrumentation for the common objective of supporting operational testing.

The Army's Future Combat Systems (FCS) is a high priority program for OTC in all mission areas. The operational testing on the FCS pro-

gram will begin with a comprehensive series of small, focused, operationally realistic limited user tests that will assist in the development process and build toward the Initial Operational Test (IOT). Given the nature of FCS, the IOT will be a relatively large and complex event, and should be the means to assess the interoperability of the FCS components and the most global operational issues.

From independent operational testing of entrenching shovels to Ground-Based Mid-Course Defense and on into FCS, the underlying philosophy that guides OTC's mission is "TRUTH IN TESTING."

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OPERATIONAL TESTING

Airborne and Special Operations Test Directorate

OTC's most unique test directorate is the Airborne and Special Operations Test Directorate (ABNSOTD) at Fort Bragg, North Carolina.

A direct descendant of the original parachute test platoon in 1940, this directorate is not only responsible for the testing of new parachutes and airborne equipment, but is also chartered to certify every item of Army equipment to be air-dropped, airlifted, sling-loaded, or in any way transported or delivered by Army or Air Force aircraft.

Certification, for every class and type of aircraft for airdrop of personnel and equipment, including new military, foreign and commercial aircraft, comes as a result of testing by this directorate and is finalized with the publication of approved airdrop rigging procedures in the appropriate technical and training manuals.

Directorate personnel conduct operational airdrop testing, using sophisticated data collection instrumentation, to validate rigging procedures and ensure that the dropped equipment functions properly when employed on the ground.

The directorate personnel also perform extensive testing of soldier equipment to be employed in airborne operations, ranging from new personnel parachute systems to any new or modified combat equipment or individual weapons systems.

The first soldiers to jump with a new item of equipment, or utilizing a new procedure, will be the troopers assigned to the directorate before any operational testing by a regular airborne unit.

The ABNSOTD Military Free-Fall Section tests numerous state of the art components and procedures directly related to Special Operations Forces infiltration and exfiltration requirements to meet both present day immediate operational needs and those of the future. These tests directly impact current and future SOF doctrine and deployment capabilities.

"Testing without documentation or measurement is opinion" according to the professionals in the Instrumentation Division. From a ground-based, high-tech video tracking system to aerial photography from fixed or rotary wing aircraft, every possible visual action from exit to ground recovery is recorded.

The Electronics Branch uses state-of-the-art instrumentation placed on test jumpers or test loads to indicate and record specific test data as directed by the test officers. Data includes G-force opening shock load, heavy drop load force transfer, pitch-roll-yaw, and time coded positional data.

ABNSOTD has the critical responsibility to provide dynamic, responsive and quality testing in order to meet the needs of the airborne and special operations communities.

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As "America's Test Paratroopers," ABNSOTD members consistently conduct tests of new equipment from all types of aircraft. (Aerial photo by ABNSOTD)



Advanced Concepts Transformation Integration Directorate

Within USAOTC the Advanced Concepts Transformation Integration Directorate (ACTID) is at the tip of the transformation test spear. While ATCID continues to be at the forefront of transformation, it is also OTC's lead in the operational testing of the Future Combat System.

Created in 1994, and redesignated in 2002 to reflect the transformation mission, this directorate was originally formed to centralize efforts of Force XXI initiatives and the proliferation of Advanced Warfighting Experiments, ACTID is responsible for independent operational testing of systems where horizontal and/or vertical integration is a primary operational issue.

ACTID was chartered to project itself well into the 21st Century and assist the other OTC test directorates in absorbing future technological trends in their test planning. It is the lead directorate for OTC support to Force XXI initiatives, Advanced Warfighting Experiments, Advanced Concepts Technology Demonstra-

tions and Advanced Technology Demonstrations where systems integration is a primary issue.

ACTID is responsible for the independent testing of operational effectiveness, suitability, and interoperability of individual systems of the Army Tactical Command and Control System.

Force XXI Battle Command Brigade and Below (FBCB2), the keystone in the Army's digitization efforts, became the focal point of ACTID in the first part of the new century.

Both at Fort Hood and then at the National Training Center, Fort Irwin, California, ACTID testers imbedded instrumentation, and themselves, into the heavy tactical units in the field to collect sophisticated data on the operation of the FBCB2 in a real-world environment.

As systems such as the Maneuver Control System and ISYSCON V4 are modified, ACTID continues to conduct interoperability tests of the Army Tactical Command and Control System.

While continuing to work the Army digitization program, ACTID also began studying the integration of that digitization into the interim and objective forces.

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ACTID remains in the forefront of Army Transformation by testing new systems like the Force XXI Battle Command Brigade and Below. (OTC Photo)



OPERATIONAL TESTING

Air Defense Artillery Test Directorate

The Army's premier air and missile defense independent operational tester is the Air Defense Artillery Test Directorate (ADATD) at Fort Bliss, Texas.

Covering the full spectrum of tests from Force Development Test and Experimentation (FDTE) or Initial Operational Test (IOT) to Limited User (LUT) and Customer Tests, ADATD also participates in Advanced Warfighting Experiments (AWE) and joint testing.

With extensive live fire range capabilities and maneuver area comprised of approximately 937,000 acres bordering White Sands Missile Range, New Mexico, ADATD has conducted missile and gun live fire tests of the TOW, PATRIOT, Avenger, HAWK, Army Tactical Missile System, Stinger, Bradley Linebacker, MLRS, and the Forward Area Air Defense (FAAD) System. With the capability to use non-eye safe lasers up to 30 kilometers, ADATD performed operational tests of DAZER and Stingray.

With unlimited ceiling and controlled airspace to fly UAVs and realistic aircraft threat profiles for air and missile defense testing, and the ability to intercept ballistic targets, ADATD is able to collect required data for independent operational test

and evaluation of weapons systems. ADATD employs highly sophisticated and state-of-the-art instrumentation in its test data collection efforts.

Equipment capabilities include a wide range of new state-of-the-art GPS tracking systems as well as older reliable Nike Hercules radars and safety surveillance radar capable of tracking up to 50 targets. A mobile command post, combined with a fixed-site command post at Oro Grande, provides the capability of conducting and controlling two tests simultaneously; a mobile radio frequency monitoring system to identify RF sources that may interfere with ADATD instrumentation systems and systems under test; and a C3I Engineering and Evaluation System (CEES) that provides interactive and scripted scenario generation capabilities for up to 2,000 data link tracks and simulated radar objects which provides a common air picture to supported tactical data system interface units.

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The Patriot PAC-3, shown here at White Sands Missile Range, went through a series of Initial Operational Tests and Evaluations in 2002. (Photo courtesy of WSMR)



Aviation Test Directorate

"Fidelis Operanti" (fidelity to the operator) appropriately states the commitment of the Aviation Test Directorate (AVTD) to the aviation soldier.

Based at West Fort Hood, Texas, the directorate maintains a close working relationship with the U.S. Army Aviation Center, evaluators, various combat arms proponents, materiel developers, the technical test community and Battle Labs.

No test is too large or too small for AVTD. The AH-64D Longbow Apache operational test was the largest and most complex Army aviation test in history. Currently, AVTD is responsible for operational testing of 19 primary aviation system programs ranging from the RAH-66 Comanche to the Air Warrior aircrew protective ensemble.

For the nine RAH-66 tests, AVTD test members participate as members of a "Combined Test Team" comprised of representatives from industry and technical testers. The combined team is expected to save tax dollars and leverage each organization's skills, experience and expertise. When the Initial Operational Test of the Comanche is completed in 2009, Army Aviation history will have been rewritten.

AVTD is in the planning stages for operational tests of the UH-60M Black Hawk in 2005, and is scheduled to test the CH-47F Chinook Cargo Helicopter that same year. Utilizing emerging technology embedded in the enhanced cockpit design, the CH-47F is designed for the Army's Objective Force on the digitized battlefield.

Other tests are smaller, such as the recently completed Combat Survivor Evader Locator (CSEL) that involved a minimum number of tests, personnel and aircraft at test sites in Florida swamps and Hawaii jungles.



*AVTD is using a building block process to test the RAH-66 Comanche helicopter.
(U.S. Army Photo)*

Over several years, and continuing with follow-on tests, AVTD employed a "team concept" in its operational testing of Special Operations Aircraft. In testing the operational effectiveness and suitability of the MH-60K and MH-47E aircraft, which required simultaneous tests in three states and aboard several Navy vessels, AVTD streamlined data collection and processing that was minimally intrusive on the unit's mission and produced a report months ahead of schedule.

From the earliest test flights of the Wright Brothers to the future testing of the RAH-66, the Army has a requirement for in-depth operational test and analysis of new systems and AVTD will fulfill that critical service.

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OPERATIONAL TESTING

Command, Control, Communications and Computers Test Directorate

As the digitized Army develops in the 21st Century, sophisticated communications and information systems will be the nerve center of every mission.

The Command, Control, Communications and Computers Test Directorate (C4TD) at West Fort Hood, is responsible for testing the systems that will carry voice, data, messaging, video-information, in the garrison, tactical and strategic environments of radios, satellites and the internet.

Comprised of the Communications-Electronics Test Division and the Computer Systems Test Division, C4TD ensures these systems are effective, suitable, survivable and supportable.

C4TD also maintains the Information Technology/Information Assurance Cell to support the testing of these systems so that vital information storage and transmission are secure, available and protected from hostile or accidental destruction and release.

Systems that come to C4TD include the Warfighter's Information System - Tactical (WIN-T); Defense Messaging System - Army (DMS-A); Secure Mobile Antijam Reliable Tactical Terminal (SMART-T); Army Key Management System; Global Combat Support System; Transportation Coordinators-Automated Information Management System (TC-AIMS); Joint Warfare System and Joint Simulation System (JWARS and JSIMS); and the Reserve Component Automation System (RCAS)

C4TD professional testers remain on the leading edge of communication and information technology to ensure that there is "value added" to systems introduced to the Army within their mission area.

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*C4TD tests all systems that carry voice, data, messaging and video information for the digitized 21st Century Army.
(ATEC Photo)*



Close Combat Test Directorate

The warrior test directorate of USAOTC is the Close Combat Test Directorate (CCTD).

Headquartered at Fort Hood, Texas, CCTD is responsible for operational testing of armor and infantry systems and is the lead OTC test directorate responsible for operational testing of the weapons and systems of the Army's Transformation force.

While continuing to conduct operational tests of upgrades in the legacy force, such as the M1A2 SEP and the Bradley M2A3, CCTD testers began their work with the Transformation force during the Initial Brigade Platform Performance Demonstration at Fort Knox, Kentucky, in January 2000, as well as supporting the train-up of the initial brigade in 2001. The first operational test on the Interim Armored Vehicle (IAV), now named STRYKER, was in September 2002 at Fort Lewis, Washington, and the Infantry Carrier Vehicle initial test is scheduled for Fort Knox at a later date.

This directorate has also conducted joint testing in Canada with the Canadian Forces utilizing the latest in instrumentation technology for collecting scientific data from the LAV III in a tactical environment.

CCTD testers are also planning for the FY03 conduct of operational tests of a Long Range Sniper Rifle; the Mortar Fire Control System; Line-of-sight anti-tank (LOSAT) weapons system, Light Weapon Thermal Sight (LWTS) and Land Warrior.

CCTD embodies the USAOTC philosophy of "Our ultimate customer is today's American Soldier."

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*OTC will continue to conduct tests on the legacy force as it begins extensive testing of the Striker Brigade Combat Team.
(U.S. Army photo)*



OPERATIONAL TESTING

Engineer and Combat Support Test Directorate

The most versatile of USAOTC's test directorates is the Engineer and Combat Support Test Directorate (ECSTD), located at Fort Hood.

ECSTD test teams conduct operational tests in the mission areas of Combat Engineer, Chemical, Transportation, Military Police, Quartermaster, Ordnance and Medical Service.

Many of the tests conducted by ECSTD are joint service such as the Joint Chemical Agent Detector, Joint Service Light Nuclear, Biological Chemical Reconnaissance System or multi-service operational tests such as the Strategic Sea Lift Program (SSP) and Theater Support Vessel transport ships.

For the Combat Engineers, ECSTD test teams have tested the High Mobility Engineer Excavator, Advanced Hornet Wide Area Munition, stand-off mine detecting systems, the Dry Support

Bridge, Improved Ribbon Bridge, and the Rapidly Emplaced Bridging System.

In other mission areas, ECSTD plans and conducts tests of the Chemical Biological Protective Shelter, the robotic Mobile Detection Assessment and Response System, the Tactical Fire Fighting Truck, Digital Topographic Support System, Forward Repair System, tactical quiet generators, Fifth Wheel Towing Device, and water purification systems.

ECSTD's operational testers are driven to conduct stressful, realistic tests to determine if products are effective, suitable and survivable in the hands of the ultimate customer - the American soldier.

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*An Abrams Main Battle Tanks rolls across the Improved Ribbon Bridge that was transported, launched and retrieved as part of the operational test and evaluation of the Common Bridge Transporter.
(Photo by John Brady, OTC Test Documentation Branch)*



Fire Support Test Directorate

The oldest of OTC's test directorates is the Fire Support Test Directorate located at the home of Field Artillery - Fort Sill, Oklahoma. FSTD is a professional, mission-focused test directorate that contributes to the field artillery's future successes on the battlefield of the 21st Century by rigorous testing under realistic operational conditions. While the professional and experienced FSTD workforce is the heart of the directorate, highly sophisticated state-of-the-art test instrumentation suites comprise the nerve system.

The principal instrumentation suite, unique to FSTD and the command, is the Fire Support Automated Test System (FSATS). This system provides FSTD the capability to conduct corps level testing of fire support C4 systems by simulating 75 percent of the corps' FS operational facilities.

This capability, unequalled in the command, has permitted robust, multiread software testing at a fraction of the cost associated with having to field live player corps facilities. The FSATS is not only a simulation-stimulation system, but is a non-intrusive data collection system with full data reduction capabilities. FSATS will soon evolve into the Extensible C4I instrumentation System, a system even more versatile than FSATS and employing the latest in software engineering technology.

FSTD is also the owner and developer of the Multimedia Transfer System (MDTS), a system designed to fully automate test data collection and permit instantaneous data transmission from multiple test sites.

Via satellite communications, MDTS moves all types of digital data, including voice, video, text, chat and data bases from a remote test location to a data collection point anywhere on the command link, and return. MDTS maintains data integrity



and enhances quality control, helps reduce test costs, and reduces time lag between data capture and data entry from weeks to minutes.

These systems will be used in the independent operational test and evaluation of HIMARS, Firefinder Q-47, and future ATACMS munition systems.

Taking advantage of new technology to collect and process test data will significantly enhance the Army's goal of Transformation and Field Artillery modernization to meet 21st Century threats.

Rigorous testing of Field Artillery systems by FSTD, under realistic operational conditions, enhances the Army's goal of Transformation to meet 21st Century threats. (Photo courtesy of WSMR)

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OPERATIONAL TESTING

Ground-Based Midcourse Defense Test Directorate

Created in 2001, the Ground-Based Midcourse Defense Test Directorate (GMDTD) was established to take advantage of OTC's early involvement in the Missile Defense Agency's (MDA) GMD program.

As the operational testing arm of the GMD Combined Test Force (CTF), the GMDTD is chartered to execute a high-paced GMD Test and Evaluation Program at minimum cost and duplication of effort that concurrently meets developmental testing (DT) and operational testing (OT) requirements. GMDTD accomplishes this by integrating developmental and operational test planning, sharing test resources, collecting and processing test data, and minimizing the duplication of test resources and the time required to execute combined testing, while preserving OT independence. GMDTD is also striving to reduce program risks wherever possible without compromising the integrity of either DT or OT.

The GMDTD and CTF have the authority and responsibility for all GMD system level combined DT/OT Tests.

GMDTD/CTF conducts combined developmental and operational testing in accordance with the GMD acquisition strategy. GMDTD/CTF acts as the single integrated team for system level testing. System tests under GMDTD/CTF cognizance include: Integrated Ground Tests (IGTs), Integrated Mission Tests (IMTs), Flight Tests, PreMission Tests (PMTs), Risk Reduction Flights (RRFs), Targets of Opportunity (TOOs), Integrated System Operation Tests (ISOTS), System Acceptance Tests, and some Specialty Tests (e.g., lethality).

GMDTD is also playing an integral role in the expansion of the GMD test range and facilities. The GMD Block 2004 Test Bed will encompass the eastern two-thirds of the Pacific Ocean. Test infrastructure will include California, Colorado, Hawaii, several locations in Alaska, and the Kwajalein Atoll (Republic of the Marshall Islands), as well as airborne and sea-borne platforms. A communications network extends the Test Bed fiber ring infrastructure to the East Coast of the U.S.

GMDTD is leading OTC's efforts to validate the GMD operational concept, assist in the development of the Block 2004 Test Bed as a means of conducting operationally realistic testing, and to verify and build confidence in overall GMD system performance.

A Ground Based Interceptor is launched as part of a combined developmental and operational test of the midcourse defense system within the Missile Defense Agency's program. (U.S. Army Photo)



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Intelligence and Electronic Warfare Test Directorate

A key ingredient to the Army's Objective Force of the future is situational awareness and information dominance. The Army's tools for this are Intelligence, Surveillance, Reconnaissance (ISR), Information Assurance (IA) and Electronic Warfare (EW). The Intelligence and Electronic Warfare Test Directorate (IEWTD) at Fort Huachuca, Arizona, is committed to providing robust synthetic operational environments, along with realistic battlefield environments, to test the future ISR, IA and EW systems of the Objective Force.

In modern-day testing, IEWTD must be concerned with how well a new item of equipment works as a system of systems within a C4ISR architecture, as well as test its resistance to a complex and evolving threat signal and IA environments. In most tests, these threats to the fidelity and density required of emerging IEW systems, must be simulated to measure the adverse effects.

IEWTD has one test division which provides special user-testing services in the areas of ISR, EW, and intelligence processing systems. This division is responsible for testing the Army's signals and imagery intelligence, service ground and airborne platforms, reconnaissance (manned and unmanned) aerial vehicles, sensors and processing systems. It also provides testing support to INSCOM, the USMC and to the evaluation of Tactical Exploitation of National Capabilities (TENCAP) equipment and procedures.

The IEWTD Technical Division, in support of the Test Division, designs tests that provide fully instrumented threat systems, dynamic scenarios and automated data extraction tools to measure the systems under test. IEWTD uses a variety of instrumentation developed by the directorate, and scenarios written by subject



matter experts to fully explore the mission effectiveness, system performance, suitability and survivability of systems in both live, simulated and emulated environments. The Directorate has an extensive Electromagnetic Environmental Effects (E3) threat and instrumentation capability that supports E3 assessments of C4ISR systems in an operational environment.

To ensure a common picture is provided to the warfighter, IEWTD works closely with the Training and Doctrine Command on intelligence doctrine and on the application of high technology solutions to intelligence distribution throughout the war space.

A Military Intelligence soldier inspects a Shadow Tactical Unmanned Aerial Vehicle for operational test flight. (Photo by John Brady, OTC Test Documentation)

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Career Opportunities

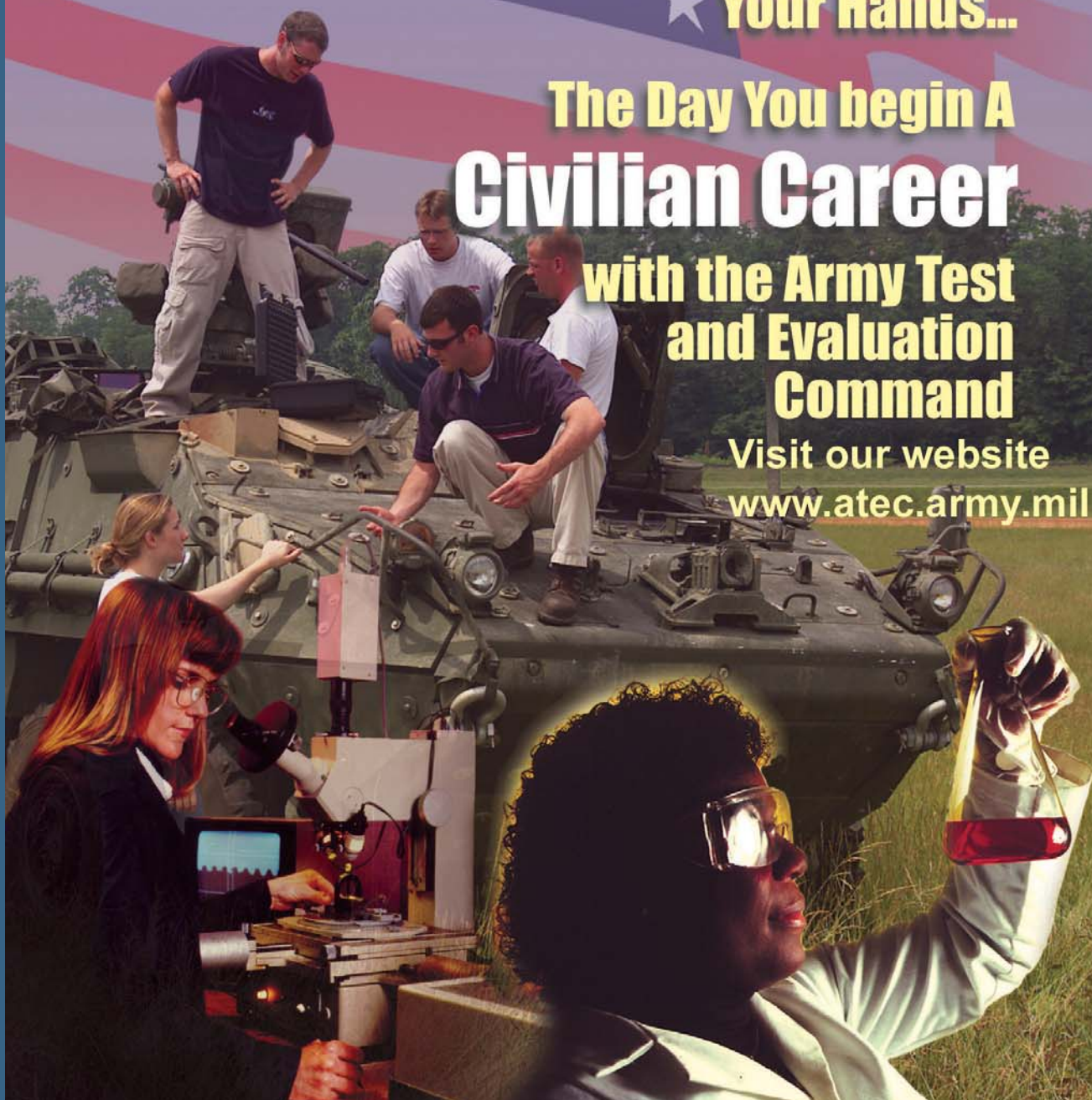
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- Student Loan Repayments
- Comprehensive Health Insurance Plans
- Employee Wellness Program
- Retirement Options
- Mass Transit Reimbursement
- Job Sharing
- Life Insurance
- 401 K/Thrift Savings Plan

However, some of the benefits of working for ATEC are not written. ATEC is an organization known for its uncompromising test and evaluation standards. ATEC's culture is noted for viewing the Soldier as the ultimate customer and ATEC strives to help its people advance and grow - personally and professionally.

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